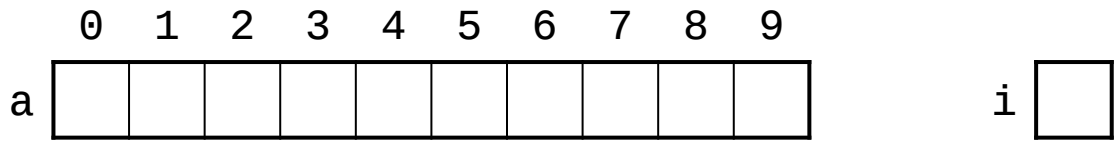
vector

```
int main()
{
   vector< int > v1( 3 );
   vector< int > v2( 6 );

   cout << "Size of v1 is " << v1.size() << "\nv1:";
   output( v1 );

   cout << "Size of v2 is " << v2.size() << "\nv2:";
   output( v2 );

   for( size_t i = 0; i < 3; i++ )
      v1[ i ] = i + 1;

   for( size_t i = 0; i < 6; i++ )
      v2[ i ] = i + 4;

   cout << "v1:";
   output( v1 );
   cout << "v2:";
   output( v2 );

   vector< int > v( v1 );

   cout << "Size of v is " << v.size() << "\nv:";
   output( v );
```

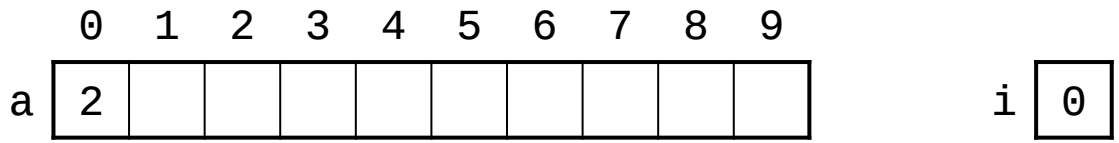
```
    if( v1 != v2 )
       cout << "v1 != v2\n\n";

    cout << "v1 = v2:\n\n";
    v1 = v2;

    cout << "v1:";
    output( v1 );
    cout << "v2:";
    output( v2 );

    if( v1 == v2 )
       cout << "v1 == v2\n\n";

    cout << "v1[ 3 ] is " << v1[ 3 ] << endl << endl;

    v1[ 3 ] = 100;

    cout << "v1[ 3 ] is " << v1[ 3 ] << endl << endl;

    cout << "v1:";
    output( v1 );
}
```

```
Size of v1 is 3
v1:   0   0   0

Size of v2 is 6
v2:   0   0   0   0   0   0

v1:   1   2   3

v2:   4   5   6   7   8   9

Size of v is 3
v:   1   2   3

v1 != v2

v1 = v2:

v1:   4   5   6   7   8   9

v2:   4   5   6   7   8   9

v1 == v2
```

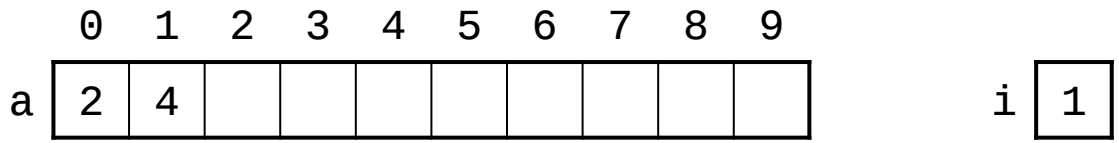
```
v1[ 3 ] is 7

v1[ 3 ] is 100

v1:   4   5   6 100   8   9
```



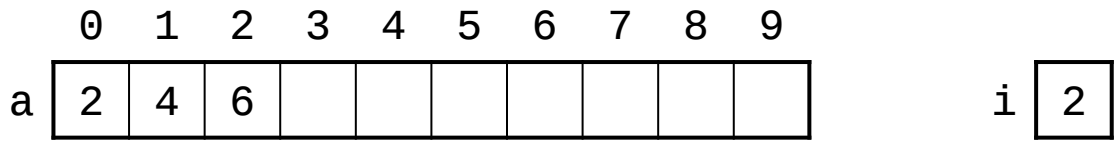

```
int main()
{
   const int arraySize = 10;
   int a[ arraySize ];
   for( int i = 0; i < arraySize; i++ )
      a[ i ] = 2 + 2 * i;
}
```



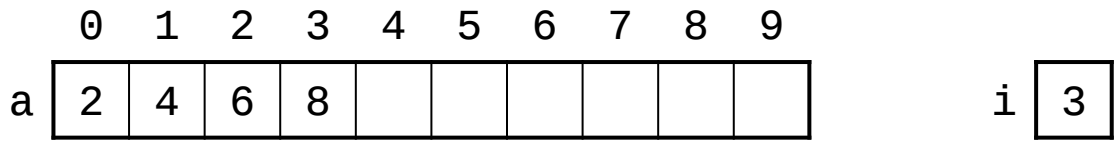

```
int main()
{
   const int arraySize = 10;
   int a[ arraySize ];
   for( int i = 0; i < arraySize; i++ )
      a[ i ] = 2 + 2 * i;
}
```



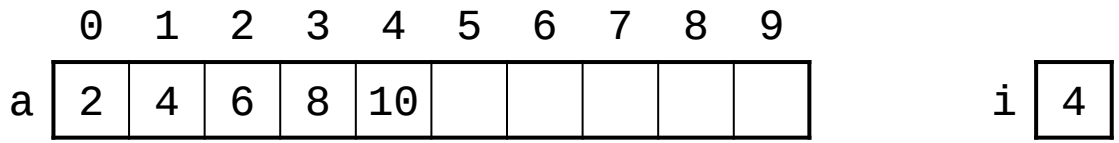

```
int main()
{
   const int arraySize = 10;
   int a[ arraySize ];
   for( int i = 0; i < arraySize; i++ )
      a[ i ] = 2 + 2 * i;
}
```




```
int main()
{
   const int arraySize = 10;
   int a[ arraySize ];
   for( int i = 0; i < arraySize; i++ )
      a[ i ] = 2 + 2 * i;
}
```




```
int main()
{
   const int arraySize = 10;
   int a[ arraySize ];
   for( int i = 0; i < arraySize; i++ )
      a[ i ] = 2 + 2 * i;
}
```



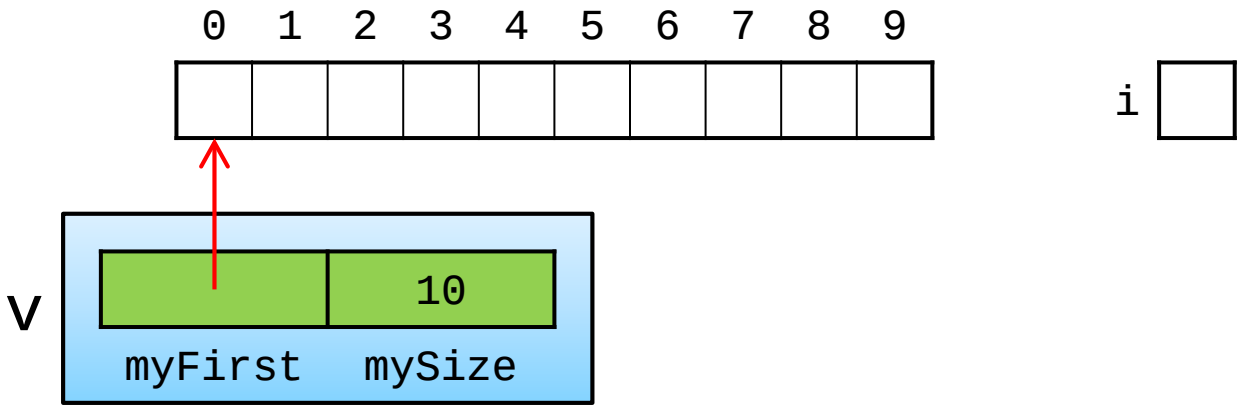

```
int main()
{
   const int arraySize = 10;
   int a[ arraySize ];
   for( int i = 0; i < arraySize; i++ )
      a[ i ] = 2 + 2 * i;
}
```

```
int main()
{
   const int arraySize = 10;
   int a[ arraySize ];
   for( int i = 0; i < arraySize; i++ )
      a[ i ] = 2 + 2 * i;
}
```

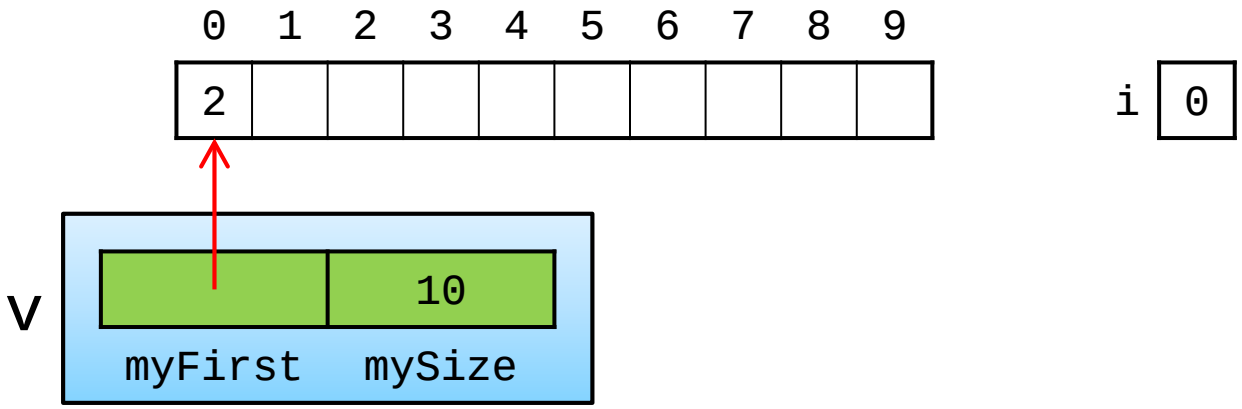
```
int main()
{
   const int vectorSize = 10;
   vector< int > v( vectorSize );
   for( int i = 0; i < vectorSize; i++ )
      v[ i ] = 2 + 2 * i;
}
```

```
class vector
{
   vector( unsigned int n = 0 )
   {
      mySize = n;
      myFirst = new int[ n ]();
   }

   vector( const vector &x )
   {
      mySize = x.mySize;
      myFirst = new int[ mySize ];
      for( unsigned int i = 0; i < mySize; i++ )
         myFirst[ i ] = x.myFirst[ i ];
   }

   unsigned int size()
   {
      return mySize;
   }
```

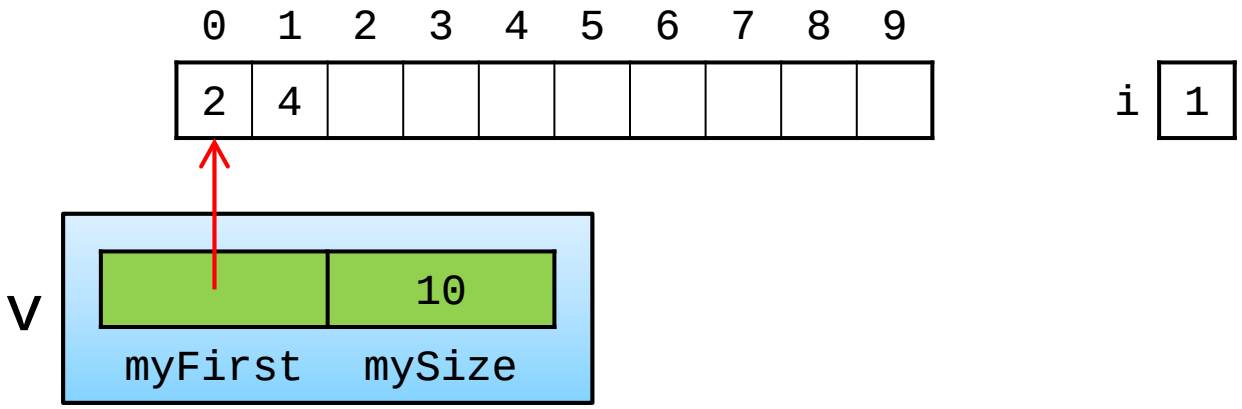
```
    void push_back( const int val )
    {
       resize( mySize + 1 );
       myFirst[ mySize - 1 ] = val;
    }

    void pop_back()
    {
       if( mySize > 0 )
       {
          --mySize;
          myFirst[ mySize ] = 0;
       }
    }

    void resize( unsigned int n )

    unsigned int mySize = 0;
    int *myFirst = nullptr;
};
```



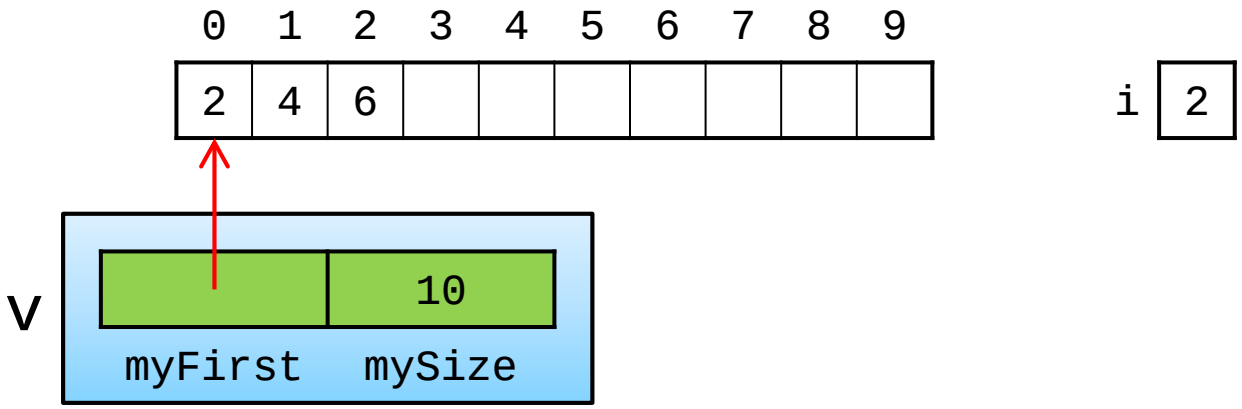

```
int main()
{
   const int vectorSize = 10;
   vector< int > v( vectorSize );
   cout < v.size() << endl;
   for( int i = 0; i < vectorSize; i++ )
      v[ i ] = 2 + 2 * i;
}
```



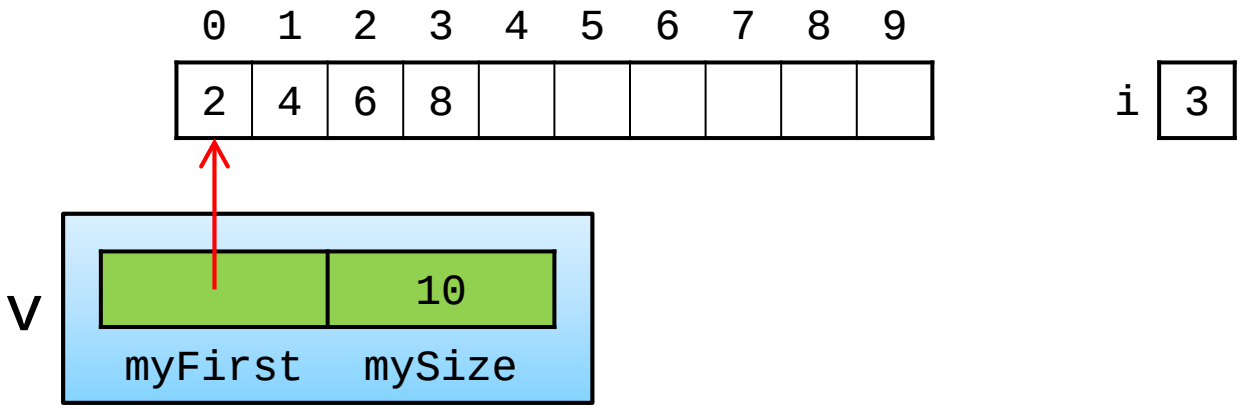

```
int main()
{
   const int vectorSize = 10;
   vector< int > v( vectorSize );
   cout < v.size() << endl;
   for( int i = 0; i < vectorSize; i++ )
      v[ i ] = 2 + 2 * i;
}
```



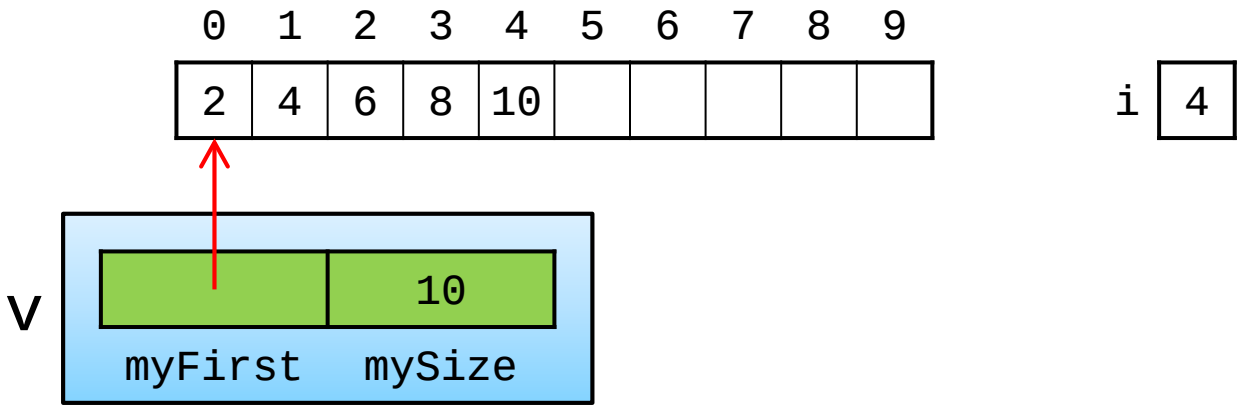

```
int main()
{
   const int vectorSize = 10;
   vector< int > v( vectorSize );
   cout < v.size() << endl;
   for( int i = 0; i < vectorSize; i++ )
      v[ i ] = 2 + 2 * i;
}
```




```
int main()
{
   const int vectorSize = 10;
   vector< int > v( vectorSize );
   cout < v.size() << endl;
   for( int i = 0; i < vectorSize; i++ )
      v[ i ] = 2 + 2 * i;
}
```



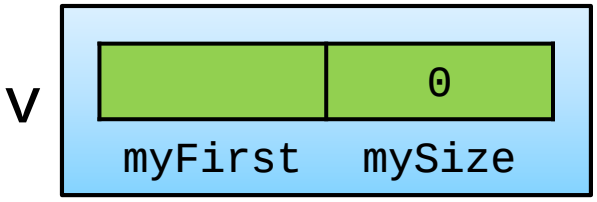

```
int main()
{
   const int vectorSize = 10;
   vector< int > v( vectorSize );
   cout < v.size() << endl;
   for( int i = 0; i < vectorSize; i++ )
      v[ i ] = 2 + 2 * i;
}
```



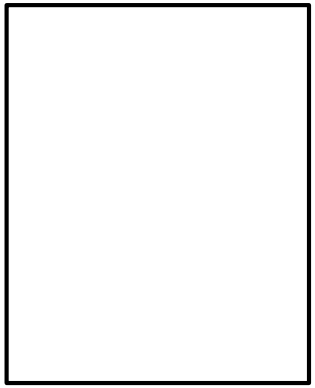

```
int main()
{
   const int vectorSize = 10;
   vector< int > v( vectorSize );
   cout < v.size() << endl;
   for( int i = 0; i < vectorSize; i++ )
      v[ i ] = 2 + 2 * i;
}
```

```
int main()
{
   const int vectorSize = 10;
   vector< int > v( vectorSize );
   for( int i = 0; i < vectorSize; i++ )
      v[ i ] = 2 + 2 * i;
}
```

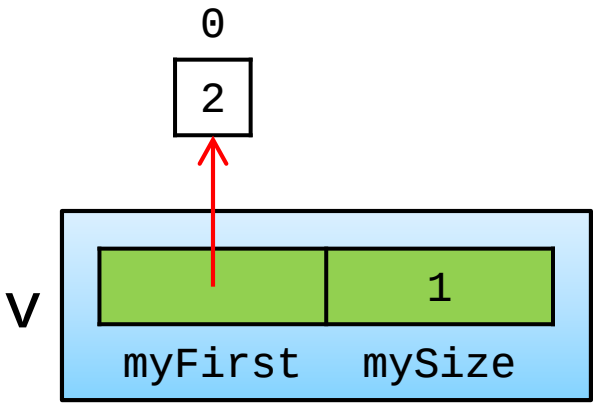
```
int main()
{
   const int vectorSize = 10;
   vector< int > v;
   for( int i = 0; i < vectorSize; i++ )
      v.push_back( 2 + 2 * i );
}
```

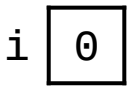



```
int main()
{
   const int vectorSize = 10;
   vector< int > v;
   for( int i = 0; i < vectorSize; i++ )
   {
      v.push_back( 2 + 2 * i );
      cout < v.size() << endl;
   }
}
```

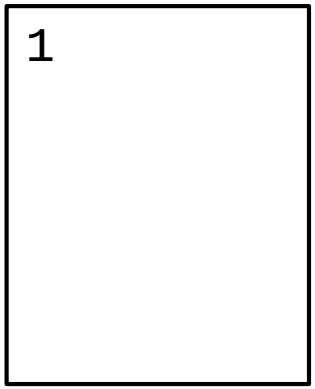


Output

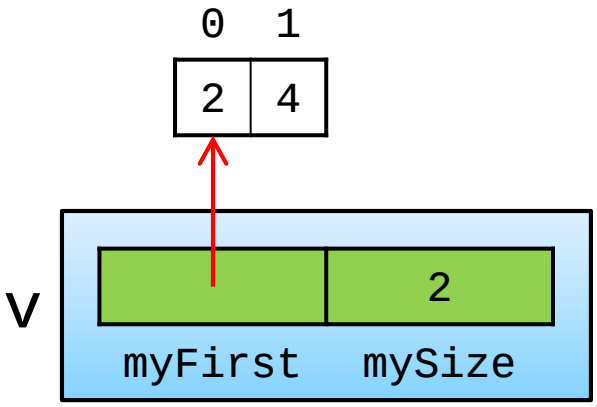


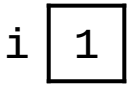



```
int main()
{
   const int vectorSize = 10;
   vector< int > v;
   for( int i = 0; i < vectorSize; i++ )
   {
      v.push_back( 2 + 2 * i );
      cout < v.size() << endl;
   }
}
```



Output

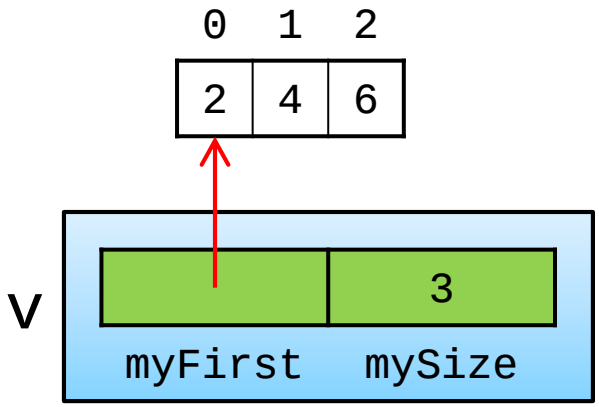


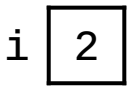



```
int main()
{
   const int vectorSize = 10;
   vector< int > v;
   for( int i = 0; i < vectorSize; i++ )
   {
      v.push_back( 2 + 2 * i );
      cout < v.size() << endl;
   }
}
```

```
1
2
```

Output

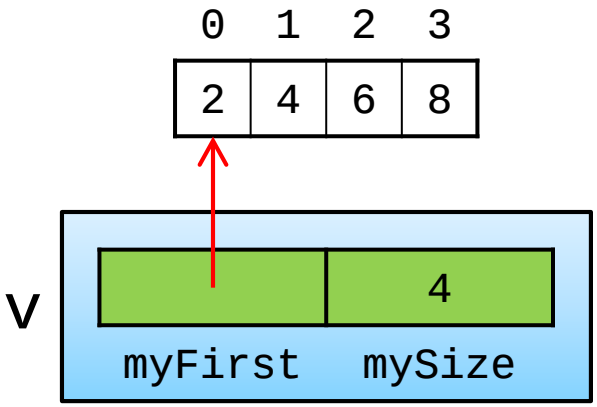


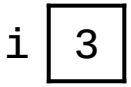



```
int main()
{
   const int vectorSize = 10;
   vector< int > v;
   for( int i = 0; i < vectorSize; i++ )
   {
      v.push_back( 2 + 2 * i );
      cout < v.size() << endl;
   }
}
```

```
1
2
3
```

Output

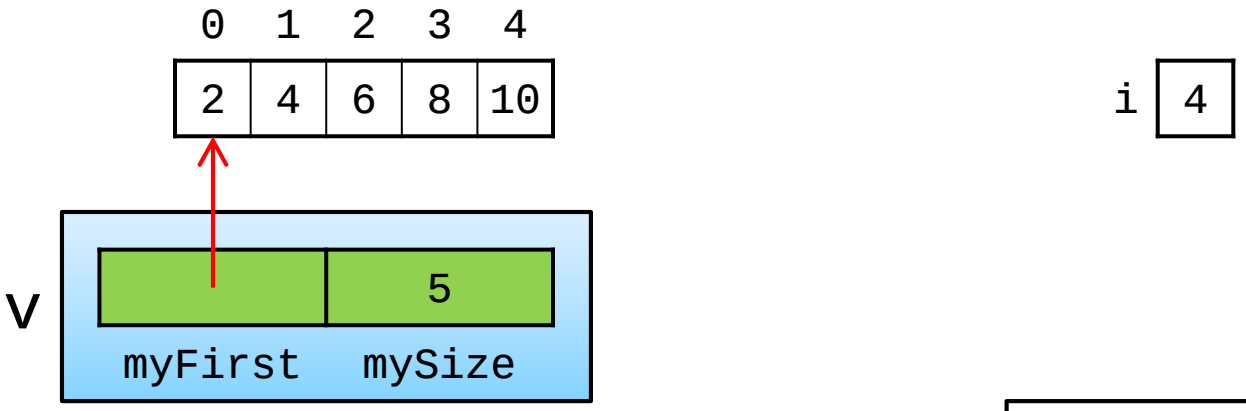





```
int main()
{
   const int vectorSize = 10;
   vector< int > v;
   for( int i = 0; i < vectorSize; i++ )
   {
      v.push_back( 2 + 2 * i );
      cout < v.size() << endl;
   }
}
```

```
1
2
3
4
```

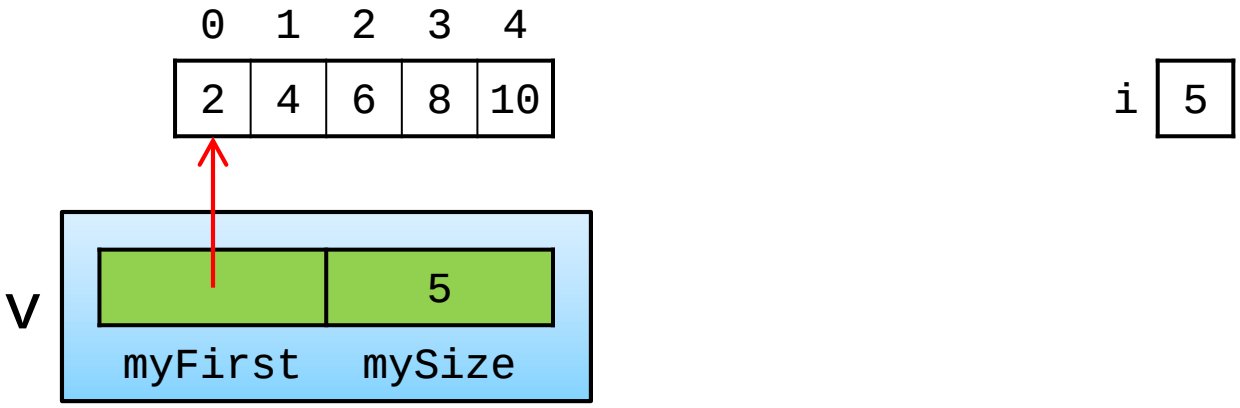
Output



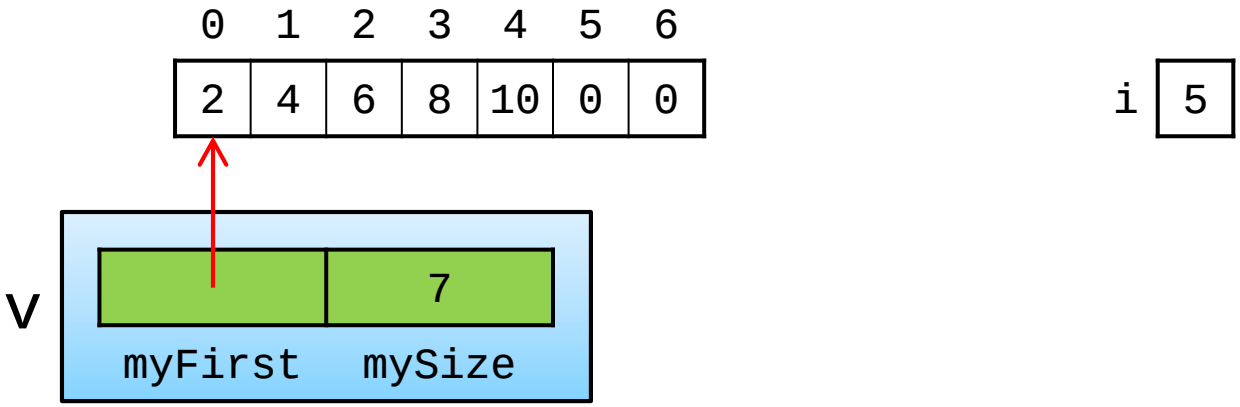

```
int main()
{
   const int vectorSize = 10;
   vector< int > v;
   for( int i = 0; i < vectorSize; i++ )
   {
      v.push_back( 2 + 2 * i );
      cout < v.size() << endl;
   }
}
```

```
1
2
3
4
5
```

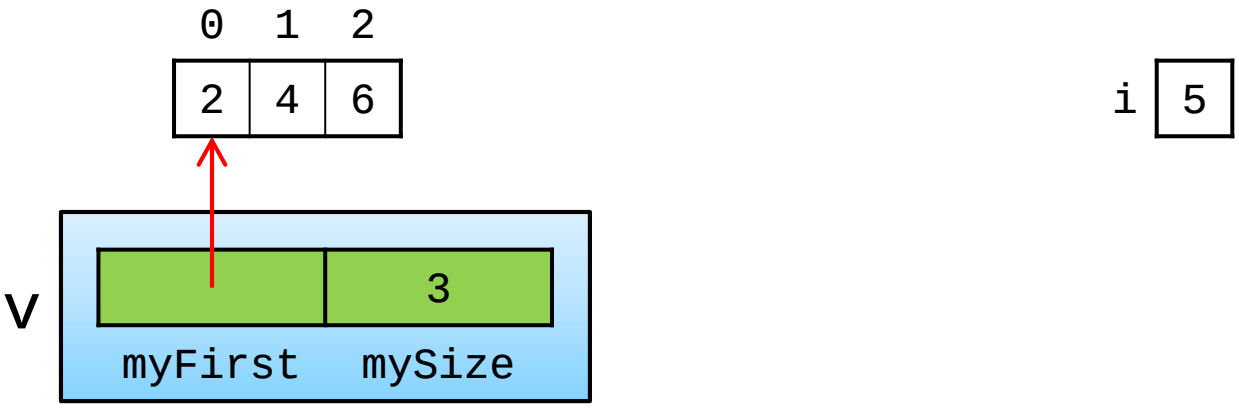
Output



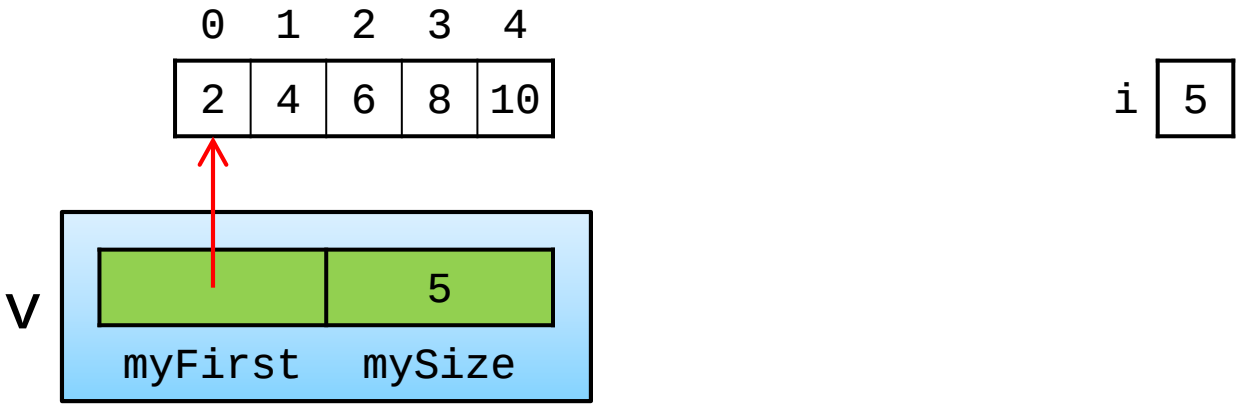

```
int main()
{
   const int vectorSize = 5;
   vector< int > v;
   for( int i = 0; i < vectorSize; i++ )
      v.push_back( 2 + 2 * i );

   v.resize( 7 );
   v.resize( 3 );
}
```



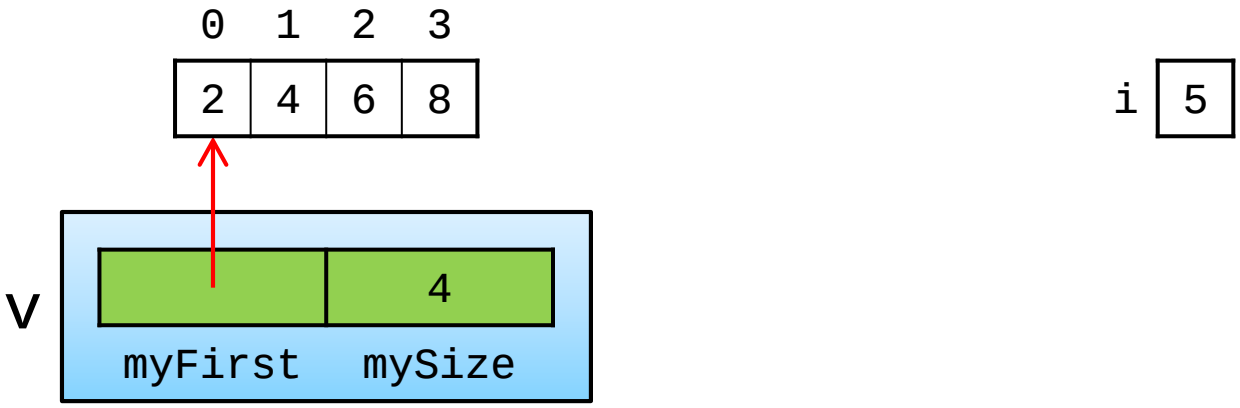

```
int main()
{
   const int vectorSize = 5;
   vector< int > v;
   for( int i = 0; i < vectorSize; i++ )
      v.push_back( 2 + 2 * i );

   v.resize( 7 );
   v.resize( 3 );
}
```



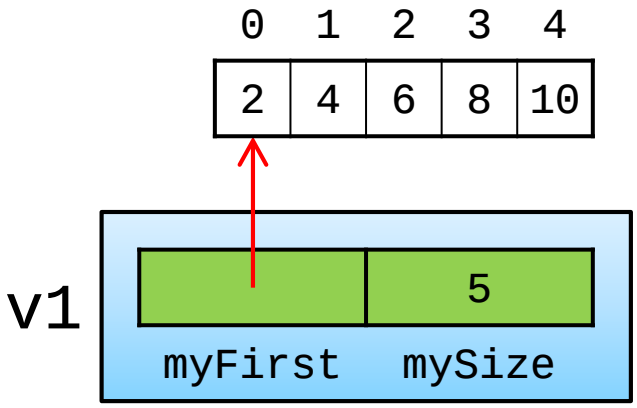

```
int main()
{
   const int vectorSize = 5;
   vector< int > v;
   for( int i = 0; i < vectorSize; i++ )
      v.push_back( 2 + 2 * i );

   v.resize( 7 );
   v.resize( 3 );
}
```



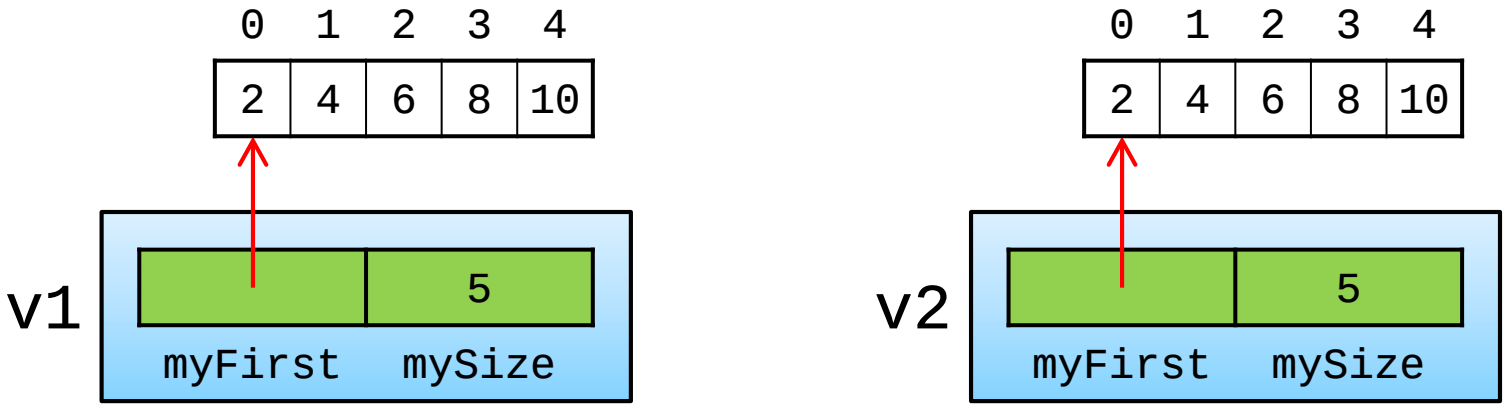

```
int main()
{
   const int vectorSize = 5;
   vector< int > v;
   for( int i = 0; i < vectorSize; i++ )
      v.push_back( 2 + 2 * i );

   v.pop_back();
}
```




```
int main()
{
   const int vectorSize = 5;
   vector< int > v;
   for( int i = 0; i < vectorSize; i++ )
      v.push_back( 2 + 2 * i );

   v.pop_back();
}
```




```
int main()
{
   const int vectorSize = 5;
   vector< int > v1;
   for( int i = 0; i < vectorSize; i++ )
      v1.push_back( 2 + 2 * i );

   vector< int > v2( v1 );
}
```

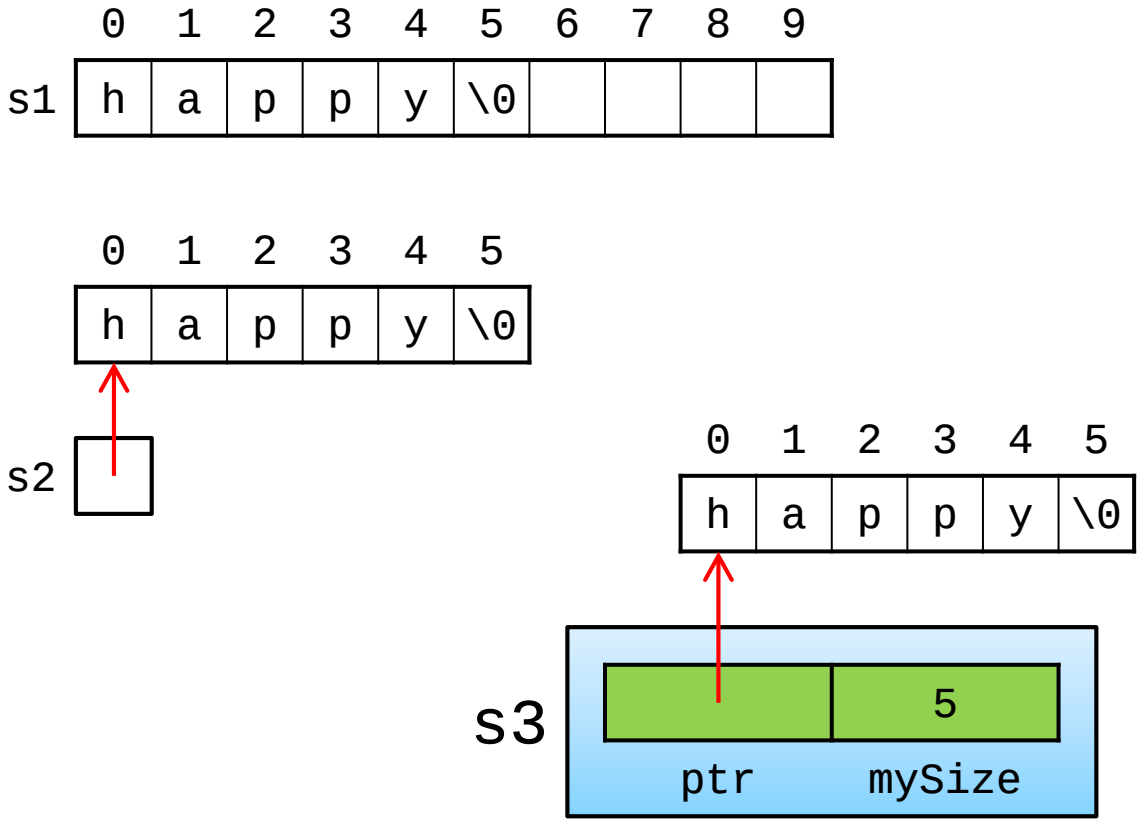



```
int main()
{
   const int vectorSize = 5;
   vector< int > v1;
   for( int i = 0; i < vectorSize; i++ )
      v1.push_back( 2 + 2 * i );

   vector< int > v2( v1 );
}
```

string

```
class string
{
   static const unsigned int npos = -1;

   unsigned int length()
   {
      return mySize;
   }

   void resize( unsigned int n )

   void clear()
   {
      mySize = 0;
   }

   bool empty()
   {
      return ( mySize == 0 );
   }
```

```
   void push_back( char c )

   void pop_back()
   {
      mySize--;
   }

   string substr( unsigned int pos = 0, unsigned int len = npos )

   unsigned int mySize = 0;
   char *ptr = nullptr;
};
```




```
int main()
{
    char s1[ 10 ] = "happy";
    char *s2 = "happy";
    string s3( "happy" );
}
```

```
int main()
{
   const int arraySize = 10;
   int a[ arraySize ] = { 87, 68, 94, 100, 83, 78, 85, 91, 76, 87 };
   int total = 0;
   for( int i = 0; i < arraySize; i++ )
      total += a[ i ];
   cout << "Total of array elements: " << total << endl;
}
```

```
int main()
{
   const int arraySize = 10;
   int a[ arraySize ] = { 87, 68, 94, 100, 83, 78, 85, 91, 76, 87 };
   vector< int > v( a, a + 10 );
   int total = 0;
   for( unsigned int i = 0; i < v.size(); i++ )
      total += v[ i ];
   cout << "Total of array elements: " << total << endl;
}
```

```
int main()
{
   const int arraySize = 5;
   int a[ arraySize ] = { 0, 1, 2, 3, 4 };

   for( int i = 0; i < arraySize; i++ )
      cout << setw( 3 ) << a[ i ];

   modifyArray( a, arraySize );

   for( int j = 0; j < arraySize; j++ )
      cout << setw( 3 ) << a[ j ];
}

void modifyArray( int b[], int sizeOfArray )
{
   for( int k = 0; k < sizeOfArray; k++ )
      b[ k ] *= 2;
}
```

```
int main()
{
   const int arraySize = 5;
   int a[ arraySize ] = { 0, 1, 2, 3, 4 };
   vector< int > v( a, a + arraySize );

   for( unsigned int i = 0; i < v.size(); i++ )
      cout << setw( 3 ) << v[ i ];

   modifyVector( v );

   for( int j = 0; j < arraySize; j++ )
      cout << setw( 3 ) << v[ j ];
}

void modifyVector( vector< int > &v )
{
   for( unsigned int k = 0; k < v.size(); k++ )
      v[ k ] *= 2;
}
```